

## AMENDMENT TO THE CLAIMS

Please cancel claims 8 and 28.

Please amend claims 1 and 27 as shown below.

1. (Currently Amended) A system for introducing payloads into earth orbit, comprising:

a reusable orbital vehicle capable of being placed in earth orbit, the orbital vehicle having an outer skin;

a thermal protection system attached to the outer skin of the orbital vehicle to thereby form an outermost layer of the orbital vehicle, the thermal protection system being formed by materials capable of withstanding environmental temperatures associated with re-entry of the orbital vehicle to thereby maintain operational viability of the orbital vehicle during re-entry;

an internal payload coupled to an interior portion of the orbital vehicle;  
and

a first external payload package affixed to the orbital vehicle at a first attachment position on the outermost layer of the orbital vehicle wherein the first external payload package is exposed to the external atmosphere during launch and re-entry phases of a space mission and is further exposed to the environment of space while in orbit ~~wherein the first attachment position is located such that destruction of the first external payload package will not affect the operational viability of the orbital vehicle.~~

2. (Previously Presented) The system of claim 1, further comprising a second external payload package affixed to the orbital vehicle at a second position on the outermost layer of the orbital vehicle wherein the second external payload package is exposed to the external atmosphere during launch and re-entry phases of the space mission and is further exposed to the environment of space while in orbit.

3. (Previously Presented) The system of claim 2 wherein the first and second external payload packages have uniform predetermined dimensions, the first

and second attachment positions being configured to receive and retain the first and second external payload packages at the first and second attachment positions.

4. (Previously Presented) The system of claim 1, further a carrier plate assembly positioned at the first attachment position to receive and retain the first external payload package.

5. (Previously Presented) The system of claim 1, further comprising an access panel on the orbital vehicle wherein first attachment position is located on the access panel.

6. (Previously Presented) The system of claim 5 wherein the access panel on the reusable orbital vehicle is removable from the orbital vehicle.

7. (Previously Presented) The system of claim 1, further comprising a carrier plate configured for attachment at the first attachment position and further configured for attachment to the first external payload package wherein the carrier plate is intermediate the outer skin surface of the orbital vehicle and the first package.

8. (Canceled)

9. (Previously Presented) The system of claim 1 wherein the orbital vehicle has an elongated shape with first and second ends with a rocket engine positioned proximate the second end of the orbital vehicle, the first attachment position being on the outermost layer of the orbital vehicle substantially at the first end.

10. (Previously Presented) The system of claim 1 wherein the orbital vehicle has an elongated shape with first and second ends with a rocket engine positioned proximate the second end of the orbital vehicle, the first attachment position being on the outermost layer of the orbital vehicle forward of a midpoint between the first end and the second end.

11. (Previously Presented) The system of claim 1 wherein the orbital vehicle has an elongated shape with first and second ends with a rocket engine positioned proximate the second end of the orbital vehicle, the first attachment position being on the outermost layer of the orbital vehicle rearward of a midpoint between the first end and the second end.

12. (Previously Presented) The system of claim 1 wherein the orbital vehicle has an elongated shape with first and second ends with a rocket engine positioned proximate the second end of the orbital vehicle, the system further comprising an aft skirt proximate the second end wherein the first attachment position is on an exterior skin portion of the aft skirt.

13. (Original) The system of claim 1 wherein the orbital vehicle has an elongated shape with first and second ends with a rocket engine positioned proximate the second end of the orbital vehicle, the system further comprising an aft skirt proximate the second end and a protected attachment position on an interior portion of the aft skirt.

14. (Original) The system of claim 1 wherein the orbital vehicle has an elongated shape with first and second ends with a rocket engine positioned proximate the second end of the orbital vehicle, the system further comprising an aft skirt proximate the second end and an attachment member mounted to an interior portion of the aft skirt.

15. (Previously Presented) A system for introducing payloads into earth orbit, comprising:

- a reusable orbital vehicle capable of being placed in earth orbit, the orbital vehicle having an elongated shape with first and second ends with a rocket engine positioned proximate the orbital vehicle second end;

- an aft skirt proximate the orbital vehicle second end, and

an attachment member rotatably mounted to an interior portion of the aft skirt.

16. (Previously Presented) The system of claim 15, further comprising a mounting bracket fixedly mounted to the interior portion of the aft skirt wherein the attachment member is moveably coupled to the mounting bracket.

17. (Previously Presented) The system of claim 16, further comprising a control system to control movement of the attachment member to move the attachment member and thereby position an external payload package outside the interior portion of the aft skirt.

18. (Original) The system of claim 14 wherein the attachment member comprises a base portion having first and second ends, the base portion first end being coupled to the interior portion of the aft skirt, an intermediate portion having first and second ends, the intermediate portion first end being coupled to the coupled to the base portion second end, and a terminal portion having first and second ends, the terminal portion first end being coupled to the coupled to the intermediate portion second end.

19. (Original) The system of claim 18, further comprising a mounting bracket fixedly mounted to the interior portion of the aft skirt wherein the base portion first end is rotatably coupled to the mounting bracket.

20. (Original) The system of claim 18 wherein the terminal portion first end is rotatably coupled to the intermediate portion second end.

21. (Original) The system of claim 18, further comprising a mounting member coupled to the terminal portion second end and configured to receive the second experimental package.

22. (Original) The system of claim 1, further comprising a sensor associated with the first experimental package, the sensor generating sensor data.

23. (Original) The system of claim 22, further comprising a data storage unit electrically coupled to the orbital vehicle and electrically coupled to the sensor, the data storage unit receiving and storing the generated sensor data.

24. (Original) The system of claim 23 for use with an avionics data bus on the orbital vehicle to monitor operation of the orbital vehicle, the data storage unit being coupled to the avionics data bus on the orbital vehicle to store data related to the operation of the orbital vehicle in association with the generated sensor data.

25. (Previously Presented) The system of claim 22 wherein the first external payload package comprises a thermal protection system.

26. (Original) The system of claim 1, further comprising an initial stage coupled to the orbital vehicle to boost the orbital vehicle from a position on earth to a predetermined altitude.

27. (Currently Amended) A system for introducing payloads into earth orbit, comprising:

a reusable orbital vehicle capable of being placed in earth orbit, the orbital vehicle an elongated body portion with first and second ends with a rocket engine positioned proximate the second end of the orbital vehicle;

an aft skirt coupled to the body portion proximate the second end and extending circumferentially around the rocket engine; and

~~an a rotatably mounted~~ attachment member mounted to an interior portion of the aft skirt, the attachment member configured to receive an experiment.

28. (Canceled)

29. (Original) The system of claim 27 wherein the attachment member is moveably mounted to the interior portion of the aft skirt, the system further comprising a control system to control movement of the attachment member to move the attachment member and thereby position the experiment outside the interior portion of the aft skirt.

30. (Original) The system of claim 29 wherein the experiment is an experimental control surface.

31. (Original) The system of claim 30 wherein the control system provides steering control of the attachment member to thereby steer the experiment while positioned outside the interior portion of the aft skirt.

32. (Original) The system of claim 27 wherein the attachment member comprises a base portion having first and second ends, the base portion first end being coupled to the interior portion of the aft skirt, an intermediate portion having first and second ends, the intermediate portion first end being coupled to the coupled to the base portion second end, and a terminal portion having first and second ends, the terminal portion first end being coupled to the coupled to the intermediate portion second end.

33. (Original) The system of claim 32, further comprising a mounting bracket fixedly mounted to the interior portion of the aft skirt wherein the base portion first end is moveably coupled to the mounting bracket.

34. (Original) The system of claim 32 wherein the terminal portion first end is moveably coupled to the intermediate portion second end.

35. (Original) The system of claim 32, further comprising a mounting member coupled to the terminal portion second end and configured to receive the experiment.

36. (Original) The system of claim 27, further comprising a sensor associated with the experiment, the sensor generating sensor data and a data storage unit to receive and store the generated sensor data.

37-70 (Canceled)